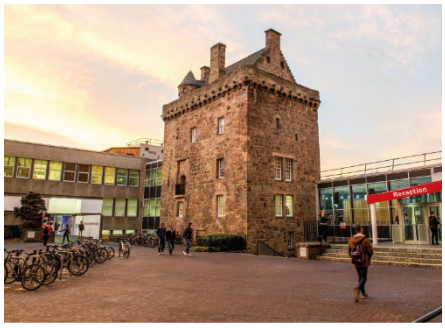
Research Fellow in Computational Fluid-Structure Interaction





Role Description

GRADE

Grade 5

LOCATION

Merchiston Campus, Edinburgh

LINE MANAGER

Dr Chennakesava Kadapa

Role Summary

The research fellow will work on the EPSRC-funded project, MAPFSI, focusing on developing computational algorithms for fluid-structure interaction problems, including multiphysics effects of electromagnetism. The research fellow will incorporate their knowledge and expertise and to develop a simulation framework for challenging FSI problems, validate it, parallelise it for HPC clusters and disseminate research outputs in the form of journal papers and presentations and posters and conferences.
The research fellow will also collaborate with other post-docs and PhD students in the project and visit academic and industrial partners, as necessary, for meetings and knowledge exchange activities.

Line Management Responsibility for:

This role does not have any line management responsibilities currently.

Main Duties and Responsibilities

- The research fellow is expected to carry out independent research and develop new computational methodologies and the associated software under the guidance of the PI and other collaborators in the project. The duties and responsibilities of the research fellow are:
- Develop advanced numerical methodologies and the associated software framework for the simulation of fluid-structure interactions of magnetoactive polymers, contributing to the success of the project.
- Validate the computational models using benchmarks and experimental results.
- Assess and improve the performance of algorithms on high-performance computing (HPC) clusters.
- Work closely with other post-docs and PhD students in the project in developing the simulation software.
- Visit academic and industrial partners, as necessary, for knowledge exchange activities and project meetings.
- Present the progress at group meetings.
- Disseminate research outputs as journal articles and presentations/posters at conferences.
- Supervise PhD students and UG/MSc students in the group where necessary.
- Comply with relevant University policies and regulations.
- Demonstrate a commitment to continuing professional development and growth.
- Role model the University's values & behaviours.
- Be responsible for ensuring that the information and records processed (received, created, used, stored, destroyed) on behalf of the University are managed in compliance with all applicable legislation, codes and policies e.g. Data Protection, Information Security and Records Management.

PERSON SPECIFICATION

	ESSENTIAL	DESIRABLE
Education / Qualifications		
• A PhD in Mechanical Engineering, Aerospace Engineering, Civil Engineering, Biomedical Engineering, Mathematics, Physics, Computational Mechanics/Engineering or related discipline. (Thesis submitted by the start date of the position.)	✔	
Skills / Experience		

• Demonstrable experience in formulating problems using the finite element method for problems in solid mechanics and fluid mechanics.	✔	
• Strong working knowledge of numerical methods such as FEM, FDM, and/or FVM.	✔	
• Proven hands-on experience with code development for computational fluid dynamics or computational solid mechanics using the finite element method.	✔	
• Demonstrable experience of working with programming languages such as C++, Fortran and Python.	✔	
• Proven hands-on experience in using simulation software such as ANSYS, OpenFOAM, StarCCM+, COMSOL etc.	✔	
• Strong organisational and communication skills, with the ability to prioritise tasks, work independently and collaboratively work with other group members.	✔	
• Ability to work independently and collaboratively within the project group.	✔	
• Proven track record of publishing articles in international journals and presentations at conferences.	✔	
• Hands-on experience in computational methods for fluid-structure interaction problems.		✔
• Hands-on experience in high-performance computing (HPC).		✔
• Hands-on experience in tools for research software development and deployment such as CMake, Git, Travis-CI, Jenkins, Doxygen, Sphinx.		✔
• Target oriented and flexibility to adapt to deadlines.		✔